Understanding the Performance Enhancement Associated with the use of Rosin in Baseball in an Electromuscular Context

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Introduction

A recent study on the topic of baseball spin as it relates to the use of rosin attributes to the use of rosin increased spin speed. With greater spin speed comes a greater ability to change the trajectory of the baseball, which translates into improved performance as the more a thrown ball curves, the more difficult it is to hit. Whereas the recent Tohoku University study https://www.tohoku.ac.jp/en/press/no_butterfingers_in_baseball.html focused exclusively on the behavior of the ball as it is released from the hand of the pitcher, this study does not successfully trace this performance enhancement to its ultimate source.

Abstract

I propose that spin velocity is greater with the use of rosin because of indirect electromuscular benefits to performance in the larger muscles of the upper arm. When a baseball is comparatively slippery, it must be gripped more tightly. The need to send stronger electrical signals to the extremities reduces the maximum level of muscle contracture possible in each of the muscle groups between the fingers and the shoulder, thereby reducing the amount of power which may be derived from those muscles. The more loosely the baseball may be gripped whilst maintaining control, the more energy can be extracted from the muscles of the upper arm and forearm as a consequence of the lack of diversion of electrical signals to pathways leading to the extremities. A metaphor which could help one to comprehend this concept is the way in which water pressure is reduced if two spigots in the house are opened at the same time. When we keep the “finger” spigots closed, we can get more pressure out of the spigots in the “upper arm” area.

Spin speed is higher, necessarily, when the overall velocity of the pitch is increased by this effect. The faster the pitch, the faster the ball is going to spin. Being able to maintain a looser grip on the ball indirectly translates into being able to throw the ball faster due to the aforementioned electromuscular effects. A looser grip earlier in the pitching motion also preserves more electrochemical energy, allowing the wrist muscles to work harder to apply spin. An overly tight grip counteracts some of the forward energy associated with the pitch, which is counter-productive.

Usefully, we may deduce that pitchers capable of throwing fastballs at velocities over 95 MPH are likely able to achieve this because they consciously or unconsciously activate muscle groups separately and in descending sequence. Attempting to activate too many muscle groups at once or in the wrong sequence creates inefficiency on many levels, particularly on the electromuscular level. Activating a single muscle group at a time, beginning with the pectoral muscles, followed by the tricep, followed by the bicep,

followed by the muscles of the forearm and, finally, the wrist, is the only way to ensure that each muscle contributes the maximum possible amount of energy at each step in the process of accelerating the ball.

Conclusion

It might be possible to train or re-train pitchers to activate these muscles in sequence by making a conscious effort not to pre-tension the muscles of the lower arm prematurely.